

## Contents

SUMMARY .....	SUM-1	
INTRODUCTION.....	SUM-1	
PURPOSE OF THE EIS.....	SUM-1	
ORGANIZATION OF THE EIS .....	SUM-1	
Proposed Action .....	SUM-2	
Related Actions and Projects.....	SUM-3	
Summary of Alternatives Considered.....	SUM-5	
Selection of the Preliminary Preferred Alternative.....	SUM-9	
Summary of Beneficial and Adverse Impacts.....	SUM-12	
Areas of Controversy.....	SUM-15	
Major Unresolved Issues .....	SUM-15	
Federal Actions Necessary.....	SUM-15	
EIS Availability.....	SUM-15	
 1.0 PURPOSE OF AND NEED FOR ACTION.....	 1-1	
1.1 DESCRIPTION OF THE PROJECT AREA .....	1-1	
1.2 PROPOSED ACTION.....	1-1	
1.3 PURPOSE OF AND NEED FOR THE PROPOSED ACTION .....	1-2	
1.3.1 Need for Access to Land .....	1-2	
1.3.2 Need for Improved Access to Airport.....	1-3	
1.3.3 Need for Economic Development.....	1-6	
1.4 HISTORY AND BACKGROUND: PLANNING STUDIES.....	1-7	
1.4.1 Waterfront Development Management Study (1982).....	1-10	
1.4.2 Land Use Inventory and Projections (1984).....	1-10	
1.4.3 Pennock and Gravina Island Neighborhood Plan (1985).....	1-10	
1.4.4 Ketchikan Gateway Borough Comprehensive Plan: Community Goals to 1990 (1986).....	1-10	
1.4.5 Coastal Management Program (1984; Revised, 1989).....	1-11	
1.4.6 Land Use Inventory (1991).....	1-11	
1.4.7 Ketchikan International Airport Industrial Development Plan (1993)....	1-11	
1.4.8 Overall Economic Development Plan (1994).....	1-12	
1.4.9 Land Use Surveys (1995 and 1996).....	1-12	
1.4.10 Ketchikan Gateway Borough Comprehensive Plan (1996).....	1-13	
1.4.11 Lewis Reef Development: Purpose, Needs, and Alternatives (1997).. <td> <td style="text-align: right;">1-14</td> </td>	<td style="text-align: right;">1-14</td>	1-14
1.4.12 Overall Economic Development Plan (1998).....	1-14	
1.4.13 Gravina Island Plan (in Preparation, 2002).....	1-14	
1.5 HISTORY AND BACKGROUND: ENGINEERING STUDIES.....	1-15	
1.5.1 Gravina Island Crossing Reconnaissance Report, 1973.....	1-16	
1.5.2 Tongass Narrows Crossing Study, 1981-1982 .....	1-16	
1.5.3 Other Tongass Narrows Crossing Studies, 1985-1992.....	1-18	
1.5.4 Environmental Impact Statement, 1994.....	1-19	
 2.0 ALTERNATIVES .....	 2-1	
2.1 ALTERNATIVES EVALUATED IN THIS EIS.....	2-1	
2.1.1 No Action Alternative.....	2-3	

2.1.2	Bridge Alternatives .....	2-3
2.1.3	Ferry Alternatives .....	2-9
2.1.4	Selection of Preliminary Preferred Alternative .....	2-10
2.2	<b>ALTERNATIVES PREVIOUSLY CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION.....</b>	<b>2-11</b>
2.2.1	Bridge Options .....	2-12
2.2.2	Tunnel Options.....	2-13
2.2.3	Tunnel-and-Bridge Option .....	2-14
2.2.4	Ferry Option.....	2-14
2.3	<b>DETERMINATION OF REASONABLE ALTERNATIVES:</b> <b>A BRIEF HISTORY.....</b>	<b>2-15</b>
2.3.1	Screening Process .....	2-15
2.3.2	Local Government and Community Input .....	2-17
2.3.3	DOT&PF Identification of Alternatives .....	2-18
2.3.4	Additional Technical Studies .....	2-19
2.3.5	Preliminary Identification of Recommended Alternative.....	2-22
2.3.6	Addition of Alternative F1 (Preferred) .....	2-23
3.0	<b>AFFECTED ENVIRONMENT .....</b>	<b>3-1</b>
3.1	<b>LAND USE .....</b>	<b>3-1</b>
3.1.1	Current Land Use.....	3-1
3.1.2	Land Use Plans and Policies.....	3-3
3.2	<b>FARMLAND.....</b>	<b>3-5</b>
3.3	<b>SOCIAL ENVIRONMENT .....</b>	<b>3-6</b>
3.3.1	Population and Social Groups.....	3-6
3.3.2	Community Character .....	3-9
3.3.3	Community and Public Facilities.....	3-11
3.3.4	Recreation Resources.....	3-12
3.3.5	Accessibility .....	3-13
3.3.6	Environmental Justice .....	3-14
3.3.7	Subsistence .....	3-15
3.3.8	Utilities .....	3-16
3.4	<b>RELOCATION .....</b>	<b>3-17</b>
3.5	<b>ECONOMIC ENVIRONMENT .....</b>	<b>3-18</b>
3.5.1	Employment and Earnings .....	3-18
3.5.2	Major Employment Industries .....	3-19
3.6	<b>JOINT DEVELOPMENT .....</b>	<b>3-22</b>
3.7	<b>TRANSPORTATION.....</b>	<b>3-22</b>
3.7.1	Aviation .....	3-22
3.7.2	Marine Navigation .....	3-29
3.7.3	Vehicular Travel.....	3-39
3.8	<b>PEDESTRIANS AND BICYCLISTS .....</b>	<b>3-42</b>
3.8.1	Pedestrians.....	3-42
3.8.2	Bicyclists .....	3-42
3.9	<b>GEOLOGY, TOPOGRAPHY, AND WIND.....</b>	<b>3-43</b>
3.9.1	Geology and Topography.....	3-43
3.9.2	Soils .....	3-43
3.9.3	Wind.....	3-44
3.10	<b>AIR QUALITY .....</b>	<b>3-44</b>
	3.10.1 Project Area Status .....	3-44

3.10.2	Air Pollutants.....	3-44
3.11	NOISE .....	3-45
3.11.1	Regulatory Overview.....	3-45
3.11.2	Sensitive Receptors .....	3-46
3.11.3	Existing Noise Sources .....	3-46
3.12	WATER QUALITY .....	3-48
3.13	PERMITS .....	3-49
3.14	WETLANDS AND VEGETATION .....	3-51
3.14.1	Wetlands.....	3-51
3.14.2	Vegetation.....	3-52
3.15	WATER BODIES AND WILDLIFE .....	3-53
3.15.1	Major Water Bodies.....	3-53
3.15.2	Ponds.....	3-54
3.15.3	Marine Habitats.....	3-54
3.15.4	Wildlife—Aquatic Species .....	3-54
3.15.5	Wildlife—Amphibians .....	3-57
3.15.6	Wildlife—Birds.....	3-57
3.15.7	Wildlife—Land Mammals.....	3-58
3.16	FLOODPLAINS .....	3-59
3.17	WILD AND SCENIC RIVERS .....	3-60
3.18	COASTAL BARRIERS.....	3-60
3.19	COASTAL ZONE .....	3-60
3.20	THREATENED OR ENDANGERED SPECIES.....	3-61
3.20.1	Humpback Whale.....	3-61
3.20.2	Steller Sea Lion.....	3-61
3.21	HISTORIC AND ARCHEOLOGICAL RESOURCES .....	3-61
3.21.1	Resources in the Project Area.....	3-61
3.21.2	Area of Potential Effect and Resources Near Alternative Alignments ..	3-63
3.22	HAZARDOUS WASTE SITES .....	3-67
3.23	VISUAL ENVIRONMENT.....	3-69
3.23.1	Tongass Narrows Area .....	3-69
3.23.2	City of Ketchikan .....	3-70
3.23.3	Gravina and Pennock Islands .....	3-70
3.23.4	Key Views .....	3-70
3.24	ENERGY .....	3-72
4.0	ENVIRONMENTAL CONSEQUENCES .....	4-1
4.1	LAND USE IMPACTS.....	4-2
4.1.1	Direct Impacts on Land Use .....	4-2
4.1.2	Consistency with Land Use Plans and Policies .....	4-5
4.2	FARMLAND IMPACTS .....	4-8
4.3	SOCIAL IMPACTS .....	4-8
4.3.1	Population and Social Groups.....	4-8
4.3.2	Neighborhoods and Community Cohesion .....	4-8
4.3.3	Community and Public Service Facilities.....	4-10
4.3.4	Recreation .....	4-10
4.3.5	Accessibility .....	4-11
4.3.6	Subsistence .....	4-13
4.3.7	Utilities .....	4-14
4.4	RELOCATION IMPACTS.....	4-17

4.4.1	No Action Alternative.....	4-17
4.4.2	Alternative C3(a).....	4-17
4.4.3	Alternative C3(b).....	4-18
4.4.4	Alternative C4 .....	4-18
4.4.5	Alternative D1 .....	4-18
4.4.6	Alternative F1 (Preferred).....	4-18
4.4.7	Alternative F3.....	4-18
4.4.8	Alternative G2 .....	4-18
4.4.9	Alternative G3 .....	4-19
4.4.10	Alternative G4 .....	4-19
4.5	ECONOMIC IMPACTS .....	4-19
4.5.1	Economy and Economic Development.....	4-20
4.5.2	Employment.....	4-21
4.6	JOINT DEVELOPMENT .....	4-22
4.7	TRANSPORTATION IMPACTS .....	4-22
4.7.1	Aviation .....	4-22
4.7.2	Marine Transportation .....	4-28
4.7.3	Vehicles .....	4-39
4.8	CONSIDERATIONS RELATING TO PEDESTRIANS AND BICYCLISTS .....	4-43
4.8.1	No Action Alternative.....	4-44
4.8.2	Alternatives C3(a) and C3(b).....	4-44
4.8.3	Alternatives C4 and D1 .....	4-45
4.8.4	Alternatives F1 (Preferred) and F3 .....	4-45
4.8.5	Alternatives G2 and G3.....	4-45
4.8.6	Alternative G4 .....	4-46
4.9	GEOLOGY, TOPOGRAPHY, AND WIND .....	4-46
4.9.1	Geology and Topography .....	4-46
4.9.2	Soils .....	4-47
4.9.3	Wind.....	4-48
4.10	AIR QUALITY IMPACTS .....	4-48
4.10.1	Pollutants of Concern.....	4-48
4.10.2	Emissions .....	4-48
4.11	NOISE IMPACTS .....	4-49
4.11.1	No Action Alternative.....	4-49
4.11.2	Alternatives C3(a), C3(b), C4, D1, G2, G3, and G4 .....	4-49
4.11.3	Alternatives F1 (Preferred) and F3 .....	4-49
4.12	WATER QUALITY IMPACTS.....	4-50
4.12.1	No Action Alternative.....	4-50
4.12.2	Alternatives C3(a), C3(b), C4, D1, F1 (Preferred), and F3.....	4-50
4.12.3	Alternatives G2, G3, and G4 .....	4-50
4.13	PERMITS .....	4-51
4.13.1	No Action Alternative.....	4-51
4.13.2	Alternatives C3(a), C3(b), C4, D1, F1 (Preferred), and F3.....	4-51
4.13.3	Alternatives G2, G3, and G4 .....	4-51
4.14	WETLAND AND VEGETATION IMPACTS .....	4-52
4.14.1	Wetlands.....	4-52
4.14.2	Vegetation.....	4-54
4.15	WATERBODIES AND WILDLIFE IMPACTS .....	4-55
4.15.1	Water Bodies .....	4-55
4.15.2	Ponds.....	4-57

4.15.3	Marine Habitat.....	4-57
4.15.4	Wildlife—Aquatic Species .....	4-60
4.15.5	Wildlife—Amphibians .....	4-63
4.15.6	Wildlife—Birds.....	4-64
4.15.7	Wildlife—Land Mammals.....	4-65
4.16	FLOODPLAIN IMPACTS .....	4-66
4.16.1	No Action Alternative.....	4-66
4.16.2	Alternatives C3(a), C3(b), C4, D1, F1 (Preferred), and F3.....	4-66
4.16.3	Alternatives G2, G3, and G4 .....	4-66
4.17	WILD AND SCENIC RIVERS .....	4-66
4.18	COASTAL BARRIERS.....	4-66
4.19	COASTAL ZONE IMPACTS .....	4-67
4.19.1	No Action Alternative.....	4-67
4.19.2	Alternatives C3(a), C3(b), C4, D1, F1 (Preferred), F3, G2, G3, & G4 ..	4-67
4.20	THREATENED AND ENDANGERED SPECIES.....	4-67
4.20.1	Steller Sea Lions.....	4-67
4.20.2	Humpback Whales .....	4-68
4.21	HISTORICAL AND ARCHEOLOGICAL PRESERVATION.....	4-68
4.21.1	No Action Alternative.....	4-69
4.22	HAZARDOUS WASTE SITES .....	4-70
4.22.1	Known Sites.....	4-70
4.22.2	Potential Sites .....	4-71
4.23	VISUAL IMPACTS .....	4-73
4.23.1	No Action .....	4-74
4.23.2	Alternative C3(a).....	4-74
4.23.3	Alternative C3(b).....	4-75
4.23.4	Alternative C4 .....	4-76
4.23.5	Alternative D1 .....	4-76
4.23.6	Alternative F1 (Preferred).....	4-77
4.23.7	Alternative F3 .....	4-79
4.23.8	Alternative G2 .....	4-80
4.23.9	Alternative G3 .....	4-80
4.23.10	Alternative G4 .....	4-81
4.24	ENERGY .....	4-81
4.25	CONSTRUCTION IMPACTS .....	4-81
4.25.1	Land Use .....	4-82
4.25.2	Social Environment .....	4-85
4.25.3	Relocation Impacts.....	4-86
4.25.4	Economy and Economic Resources.....	4-86
4.25.5	Transportation .....	4-88
4.25.6	Pedestrians and Bicyclists.....	4-93
4.25.7	Geological Resources .....	4-93
4.25.8	Air Quality .....	4-93
4.25.9	Noise and Vibration.....	4-94
4.25.10	Water Quality .....	4-95
4.25.11	Wetlands.....	4-96
4.25.12	Water Body Modification and Wildlife.....	4-96
4.25.13	Floodplains .....	4-99
4.25.14	Coastal Zone .....	4-99
4.25.15	Threatened and Endangered Species.....	4-99

4.25.16	Historic and Archeological Preservation.....	4-100
4.25.17	Hazardous Waste Sites.....	4-101
4.25.18	Visual Environment .....	4-101
4.25.19	Energy .....	4-102
4.25.20	Utilities .....	4-102
4.26	<b>SECONDARY IMPACTS .....</b>	4-102
4.26.1	Land Use Impacts .....	4-104
4.26.2	Social Impacts.....	4-107
4.26.3	Economic Impacts.....	4-109
4.26.4	Transportation Impacts .....	4-125
4.26.5	Pedestrians and Bicyclists.....	4-131
4.26.6	Air Quality Impacts .....	4-132
4.26.7	Noise Impacts .....	4-134
4.26.8	Water Quality Impacts.....	4-142
4.26.9	Wetland and Vegetation Impacts.....	4-143
4.26.10	Water Body Modification and Wildlife Impacts.....	4-145
4.26.11	Floodplain Impacts.....	4-147
4.26.12	Coastal Zone Impacts .....	4-147
4.26.13	Threatened or Endangered Species Impacts .....	4-147
4.26.14	Historic and Archeological Preservation.....	4-148
4.26.15	Visual Impacts .....	4-149
4.26.16	Energy Impacts.....	4-150
4.26.17	Utility Impacts .....	4-150
4.27	<b>CUMULATIVE IMPACTS.....</b>	4-151
4.27.1	Land Use Impacts .....	4-153
4.27.2	Social Impacts.....	4-154
4.27.3	Economic Impacts.....	4-155
4.27.4	Transportation Impacts .....	4-156
4.27.5	Pedestrian and Bicyclist Impacts.....	4-157
4.27.6	Geology and Soils Impacts.....	4-157
4.27.7	Water Quality Impacts.....	4-157
4.27.8	Wetland Impacts .....	4-158
4.27.9	Water Body Modification and Wildlife Impacts.....	4-158
4.27.10	Historic and Archaeological Resources.....	4-160
4.27.11	Visual Impacts .....	4-160
4.28	<b>SHORT-TERM USES AND LONG-TERM PRODUCTIVITY .....</b>	4-161
4.28.1	No Action Alternative.....	4-161
4.28.2	Alternatives C3(a), C3(b), C4, D1, F1 (Preferred), F3, G2, G3, & G4 .....	4-161
4.29	<b>IRREVERSIBLE &amp; IRRETRIEVABLE COMMITMENTS OF RESOURCES .....</b>	4-162
4.29.1	No Action Alternative.....	4-162
4.29.2	Alternatives C3(a), C3(b), C4, D1, F1 (Preferred), F3, G2, G3, & G4 .....	4-162
5.0	<b>LIST OF PREPARERS.....</b>	5-1
6.0	<b>EIS DISTRIBUTION LIST.....</b>	6-1

7.0	COMMENTS AND COORDINATION .....	7-1
7.1	PUBLIC AND AGENCY SCOPING PROCESS.....	7-1
7.1.1	Environmental Scoping Process.....	7-1
7.1.2	Notice of Intent.....	7-2
7.1.3	Project Scoping Plan.....	7-2
7.1.4	Scoping Activities.....	7-3
7.2	SUMMARY OF SCOPING MEETING COMMENTS .....	7-15
7.2.1	Agency Scoping Comments .....	7-15
7.2.2	Public Scoping Comments on Project Issues .....	7-18
7.2.3	Public Suggestions for Project Alternatives .....	7-21
7.3	PROJECT DEVELOPMENT TEAM (PDT).....	7-21
7.3.1	Purpose and Membership .....	7-21
7.3.2	Meetings .....	7-22
7.4	AGENCY COORDINATION AND CONCURRENCE PROCESS .....	7-23
7.4.1	Lead and Cooperating Agencies .....	7-23
7.4.2	Agency Concurrence.....	7-23

## REFERENCES

## INDEX

### List of Tables

Table 1-1	Planning Studies Addressing Access to Gravina Island.....	1-9
Table 1-2	Engineering Studies Addressing Access to Gravina Island.....	1-15
Table 2-1	Summary of Descriptions of Reasonable Alternatives .....	2-2
Table 2-2	Factors for Screening of Options .....	2-15
Table 2-3	Early Cost Estimates for 18 Initial Build Options .....	2-16
Table 3-1	2000 U.S. Census Population in Alaska and the Ketchikan Gateway Borough ....	3-7
Table 3-2	2000 U.S. Census Bureau Median Household Income .....	3-8
Table 3-3	U.S. Department of Health and Human Services Poverty Guidelines for 2000 ....	3-9
Table 3-4	Travel Times from Revillagigedo Island to Ketchikan International Airport.....	3-14
Table 3-5	Employment and Earnings in the Ketchikan Gateway Borough, 2001.....	3-19
Table 3-6	Floatplane Facilities and Operations.....	3-25
Table 3-7	Tongass Narrows Total Trips and Maximum Drafts, by Vessel Type, by Year ...	3-30
Table 3-8	Cruise Ship Arrival Data For Ketchikan 1990 -2001 .....	3-32
Table 3-9	Large Cruise Ships Operating in Southeast AK During 2002 Cruise Season .....	3-33
Table 3-10	Small Cruise Vessels Operating in Southeast Alaska .....	3-34
Table 3-11	Ketchikan Harbor Capacities .....	3-37
Table 3-12	1998 Boat Use in Ketchikan .....	3-37
Table 3-13	2002 Ketchikan Boat Launch Permits .....	3-38
Table 3-14	Level-of-Service Criteria For Intersections.....	3-40
Table 3-15	Existing Level-of-Service at Project Area Intersections.....	3-41
Table 3-16	Travel Distances and Estimated Vehicular Travel Times .....	3-42
Table 3-17	Ketchikan Airport Wind Statistics .....	3-44

Table 3-18	Noise Abatement Criteria.....	3-45
Table 3-19	Noise Levels at Sensitive Receptors .....	3-47
Table 3-20	Distance to Impact Thresholds Based on Existing Traffic .....	3-48
Table 3-21	Essential Fish Habitat Groundfish Species in Project Area.....	3-56
Table 3-22	Essential Fish Habitat Salmon Species in Project Area .....	3-56
Table 3-23	RCRA Permitted Sites .....	3-68
Table 3-24	Known Contaminated Sites .....	3-69
Table 4-1	Summary of Economic Impacts on Ketchikan Gateway Borough 2003-2025.....	4-20
Table 4-2	Estimated Operations and Maintenance Spending in the Ketchikan Gateway Borough by Alternative .....	4-21
Table 4-3	Estimated Operations and Maintenance Jobs in the Ketchikan Gateway Borough By Alternative.....	4-22
Table 4-4	Analysis of Sailing Time between Juneau and Ketchikan Using Maximum Cruising Speed for Alternatives C3(b) and D1 .....	4-32
Table 4-5	Estimated New Port Call Length – Northbound (NB) and Southbound (SB) Voyages for Alternatives C3(b) and D1.....	4-32
Table 4-6	Analysis of Sailing Time between Juneau and Ketchikan for Alternative F3 – Pennock Island Crossing .....	4-35
Table 4-7	Travel Distances and Estimated Vehicular Travel Times .....	4-40
Table 4-8	Travel Distances and Estimated Pedestrian Travel Times .....	4-43
Table 4-9	Travel Distances and Estimated Bicycle Travel Times.....	4-44
Table 4-10	Estimated Annual Emissions Associated with Alternatives .....	4-49
Table 4-11	Impacts on Wetlands, Ponds, and Uplands (Acres) .....	4-52
Table 4-12	Potential Loss of Essential Fish Habitat (Acres) .....	4-62
Table 4-13	Estimated Local Construction Spending in the Ketchikan Gateway Borough.....	4-86
Table 4-14	Estimated Acquisition Costs .....	4-87
Table 4-15	Estimated Construction Jobs in the Ketchikan Gateway Borough.....	4-88
Table 4-16	Development Scenarios Assumed for Gravina and Pennock Islands in the Secondary Impact Analysis.....	4-104
Table 4-17	Secondary Effects of Construction Spending on Employment, Income, and Government Revenue.....	4-111
Table 4-18	Annual Secondary Economic Effects of Operations .....	4-113
Table 4-19	Cruise Ship Spending (per Port Call) .....	4-114
Table 4-20	Estimated Cruise Ship Passenger Hourly Spending (per Port Call) .....	4-115
Table 4-21	Potential Annual Cruise-related Spending Reductions with Reduced Port Calls for Alternatives C3(b) and D1 .....	4-116
Table 4-22	Potential Annual Reductions in Cruise Ship Passenger Spending with Reduced Port Time for North Bound Sailings with Alternatives C3(b) & D1 .....	4-116
Table 4-23	Summary of Reduction in Annual Cruise-Related Spending with Alternatives C3(b) and D1 (2001 Base Year).....	4-117
Table 4-24	Annual Secondary Economic Effects from Reduced Cruise-related Spending with Alternatives C3(b) and D1 .....	4-117
Table 4-25	Potential Annual Cruise-related Spending Reductions with Alternative F3.....	4-118
Table 4-26	Annual Secondary Economic Effects from Reduced Cruise-related Spending with Alternative F3 .....	4-118
Table 4-27	Fiscal Effect of Changes in SVFR Operations on Local Government Sales Tax Revenues .....	4-120
Table 4-28	Regional Economic Development in Gravina Access Project Service Area .....	4-123
Table 4-29	User Economic Benefits of Gravina Access Project Alternatives 2003-2025....	4-124
Table 4-30	Traffic Projections: One-Way Trips Across Tongass Narrows.....	4-127

Table 4-31	Level of Service at Project Area Intersections-No Action and Bridge Alternatives (Projections for 2025 Assuming Medium Economic Growth) .....	4-128
Table 4-32	Level of Service at Project Area Intersections-Ferry Alternatives (Projections for 2025 Assuming Medium Economic Growth) .....	4-129
Table 4-33	PM10 Concentrations at Dryden Monitoring Station, Juneau, Alaska .....	4-133
Table 4-34	Distance from Centerline to Noise Impact Thresholds for No Action Alternative .....	4-135
Table 4-35	Distance from Centerline to Noise Impact Thresholds for Alternatives C3(a), C3(b), C4, and D1 .....	4-136
Table 4-36	Distance from Centerline to Noise Impact Thresholds for Alternatives F1 and F3 .....	4-138
Table 4-37	Distance from Centerline to Noise Impact Thresholds for Alternative G2.....	4-140
Table 4-38	Distance from Centerline to Noise Impact Thresholds for Alternatives G3 .....	4-141
Table 4-39	Distance from Centerline to Noise Impact Thresholds for Alternatives G4 .....	4-142
Table 7-1	Project Scoping Activities (1999-2002) .....	7-10

## List of Figures

	On or following page	
Figure 1.1	Project Area.....	1-19
Figure 2.1	Initial Project Options: Alignments .....	2-24
Figure 2.2	EIS Alternatives: Alignments .....	2-24
Figure 2.3	Typical Cross-Sectional Views of Proposed Roadways and Bridges .....	2-24
Figure 2.4	Ketchikan International Airport: Circulation and Parking (for Build Alternatives).2-24	2-24
Figure 2.5	No Action Alternative, Existing Ferry Between Airport Ferry Terminals: Alignment .....	2-24
Figure 2.6	Alternative C3(a), 200' Bridge Between Signal Road and South of Airport Terminal: Alignment .....	2-24
Figure 2.7	Alternative C3(b), 120' Bridge Between Signal Road and Airport Terminal: Alignment .....	2-24
Figure 2.8	Alternative C4, 200' Bridge Between Tongass Avenue (North of Cambria Drive) and South of Airport Terminal: Alignment.....	2-24
Figure 2.9	Alternative D1, 120' Bridge Between Tongass Avenue (near Existing Ferry) and Airport Terminal: Alignment .....	2-24
Figure 2.10	Alternative F1, Bridges (200' East and 120' West) Between Tongass Avenue and Airport, via Pennock Island: Alignment.....	2-24
Figure 2.11	Alternative F3, Bridges (60' East and 200' West) Between Tongass Avenue and Airport, via Pennock Island: Alignment.....	2-24
Figure 2.12	Alternatives C3(a) and C3(b): Bridge Profiles .....	2-24
Figure 2.13	Alternatives C4 and D1: Bridge Profiles.....	2-24
Figure 2.14	Alternatives F1 and F3: Bridge Profiles.....	2-24
Figure 2.15	Alternative F3, West Channel Widening .....	2-24
Figure 2.16	Alternative F3, West Channel Widening Cross-Sections.....	2-24
Figure 2.17	Alternative G2, Ferry Between Peninsula Point and Lewis Point: Alignment....	2-24
Figure 2.18	Alternative G3, Ferry Between Downtown and South of Airport: Alignment .....	2-24
Figure 2.19	Alternative G4, Ferry Between New Terminals Adjacent to Existing Terminals: Alignment.....	2-24
Figure 2.20	Ferry Terminal: Typical Layout .....	2-24
Figure 3.1	Land Ownership .....	3-72
Figure 3.2	Zoning .....	3-72
Figure 3.3	Land Use .....	3-72

Figure 3.4	Gravina Island Area Plan Map.....	3-72
Figure 3.5	Population of the Ketchikan Gateway Borough, 1990-2000 .....	3-72
Figure 3.6	Diversity by Block Group .....	3-72
Figure 3.7	1999 Median Household Income .....	3-72
Figure 3.8	Community and Recreation Facilities.....	3-72
Figure 3.9	Major Employers in the Ketchikan Area .....	3-72
Figure 3.10	Aviation Transportation Facilities .....	3-72
Figure 3.11	Ketchikan International Airport: Existing Conditions.....	3-72
Figure 3.12	Marine and Land Transportation Facilities .....	3-72
Figure 3.13	Tongass Narrows Primary Waterway Uses.....	3-72
Figure 3.14	Traffic Analysis Intersections .....	3-72
Figure 3.15	Water Resources.....	3-72
Figure 3.16	Biological Resources (Wetlands and Uplands) .....	3-72
Figure 3.17	Other Biological Resources .....	3-72
Figure 3.18	Hazardous Waste Sites .....	3-72
Figure 3.19	Key Viewpoints.....	3-72
Figure 4.1	Realignment of the Alternatives F1 and F3 .....	4-162

## Appendices

- A Preliminary Quantities and Cost Estimate Technical Memorandum
- B Pennock Island and Gravina Island/Clam Cove Public Outreach Summary
- C Conceptual Stage Relocation Study
- D Economic Impact Assessment
- E Wind Climatology Technical Memorandum
- F Consequences of Various Channel Closures to Large Shipping
- G Reconnaissance of Vessel Navigation Requirements
- H Monte Carlo Navigation Simulation Technical Memorandum
  - Supplemental Monte Carlo Navigation Simulation Study Technical Memorandum
- I RTM STAR Center Report
- J Real Time Navigation Simulation Study (STAR Center) Technical Memorandum
- K Effects on Cruise Ship Operations
- L Draft U.S. Army Corps of Engineers Section 10/404 Permit Application,  
Preliminary Jurisdictional Determination, and Draft 404 (b)(1) Analysis
- M Wetlands Evaluation Technical Memorandum
- N Marine Environment Impact Assessment Technical Memorandum
- O Essential Fish Habitat Assessment
- P Hazardous Materials Investigation Report
- Q Estimate of Air Quality Impacts
- R Public and Agency Comment

**APPENDIX A**  
**Preliminary Quantities and Cost Estimate**  
**Technical Memorandum**

**APPENDIX B**  
**Pennock Island and Gravina Island/  
Clam Cove Public Outreach Summary**

## **APPENDIX C**

### **Conceptual Stage Relocation Study**

## **APPENDIX D**

### **Economic Impact Assessment**

## **APPENDIX E**

### **Wind Climatology Technical Memorandum**

## **APPENDIX F**

### **Consequences of Various Channel Closures to Large Shipping**

## **APPENDIX G**

### **Reconnaissance of Vessel Navigation Requirements**

**APPENDIX H**  
**Monte Carlo Navigation Simulation Technical Memorandum**  
**Supplemental Monte Carlo Navigation Simulation Study**  
**Technical Memorandum**

## **APPENDIX I**

### **RTM STAR Center Report**

**APPENDIX J**  
**Real Time Navigation Simulation Study (STAR Center)**  
**Technical Memorandum**

## **APPENDIX K**

### **Effects on Cruise Ship Operations**

## **APPENDIX L**

**Draft U.S. Army Corps of Engineers Section 10/404 Permit Application,  
Preliminary Jurisdictional Determination, and Draft 404 (b)(1) Analysis**

**APPENDIX M**  
**Wetlands Evaluation Technical Memorandum**

**APPENDIX N**  
**Marine Environment Impact Assessment**  
**Technical Memorandum**

## **APPENDIX O**

### **Essential Fish Habitat Assessment**

## **APPENDIX P**

### **Hazardous Materials Investigation Report**

## **APPENDIX Q**

### **Estimate of Air Quality Impacts**

## **APPENDIX R**

### **Public and Agency Comment**